International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

Implementation of Pelvic Floor Muscles Strengthening Training in Various Positions for Diabetic Woman with Stress Urinary Incontinence

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ABSTRACT

Stress Urinary Incontinence is a common problem with widespread human and social implication causing discomfort, shame, and loss of self-confidence. It also affects the quality of life of at least one third of women globally in many ways and may limit women's social and personal relationship. It starts gradually increases and at the point of time women stop during their normal activities. Obviously in women suffering from SUI, the leakages are the most important factor affecting the quality of life. This SUI causes wetness, odour, discomfort, and skin irritation; it can also damage self-esteem because of feeling of shame, embarrassment, and stigmatization. Some women have SUI of a mild nature and do not feel that treatment of the condition is warranted others are embarrassed to speak with a health care provider about their condition. The causes of this condition are Pregnancy and childbirth, especially having multiple vaginal deliveries due to weakness of pelvic floor muscles, menopause, diabetes, obesity. The exact link between diabetes and incontinence is unknown. The four possible ways that diabetes can contribute to incontinence are, Obesity puts pressure on your bladder, nerve damage affects the nerves that control the bowel and bladder, a compromised immune system increases the risk for urinary tract infection, which can cause incontinence. The diabetic medications to regulate high blood sugar levels, forces glucose from the blood out into the urine. When this happens, the bladder can become irritated leading to incontinence. The prevalence of UI among diabetics and non-diabetics was 39% and 26% respectively. Pelvic Floor rehabilitation is generally the first-line treatment for female patients with SUI. This study aims to reduce the symptoms of stress urinary continence and significantly improve the quality of life of women by strengthening their pelvic floor muscles which is performing in various positions. And this will increase the strength, endurance, and coordination of muscle activity. The parameter used is incontinence impact questionnaire.

Keywords: Stress Urinary Incontinence, Diabetes, Women, Incontinence Impact Questionnaire, Pelvic Floor Muscle Strengthening Exercises.

1. INTRODUCTION

Urinary incontinence is a common problem with widespread human and social implication causing discomfort, shame, and loss of self-confidence. Urinary incontinence commonly classified as the stress urinary incontinence (SUI); urge urinary incontinence (UUI); mixed urinary incontinence (MUI). Stress urinary incontinence is defined by the "international continence society" as the complaint of any involuntary loss of urine on efforts (or)physical exertion [1]. Stress urinary incontinence is called as silent epidemic, which is not a life-threatening condition, but a worldwide problem at the same time. It affects the quality of life one third women globally in many ways and may limit women's social and personal relationship. It starts gradually increases and at the point of time women stop during their normal activities. Basic cause of stress urinary incontinence is the weakness of pelvic floor muscles supporting the proximal urethra. Hence, the intra vesicle pressure exceeds the maximal urethral pressure during exertion [2] which results in increased intra-abdominal pressure. The influencing factors of SUI can be divided into categories that predispose,incite,promote (or) intervene change in pelvic floor disorders. Predisposing factors such as menopause, which is as an aging process associated with a higher risk of SUI among women that may be related to general loss of muscle tone, long term effects of injuries experienced during parturition? Inciting factors for SUI include damage to the pelvic floor due to pregnancy and childbirth. Other factors can be corrected to promote the condition: including obesity & smoking. Evidence suggests that the prevalence of SUI is increases proportionately to a rising BMI where the increased intra-abdominal pressure due to a rising BMI may reduce the continence gradient between the urethra & bladder. Intervening factors include drug therapies and surgery. Also, mechanical pressure as in tumors of the bladder (or) pelvis, medical condition as diabetes. Medications as diuretics can directly contribute to bladder over activity. Diabetes mellitus [14,15] is a worldwide health problem with rising numbers of prevalence are contributable to a change in lifestyle, increasing obesity rates, and aging of the population. While it is known that incontinence is more common in women with diabetes, mechanism by which type 2 diabetes, may contribute to its development(or) severity are not well defined. A likely etiology for incontinence is micro vascular damage, like the disease process involved in development of retinopathy, nephropathy, peripheral neuropathy. Accordingly, duration of diabetes, insulin treatment, peripheral neuropathy and retinopathy have been shown to be important risk factors for incontinence among women with diabetes. The prevalence of UI among diabetics and non-diabetics was 41.0% and 22.1% respectively. This SUI causes wetness, odor, discomfort, and skin irritation; it can also damage self-esteem because of feeling of shame, embarrassment, and stigmatization. Some women have SUI of a mild nature and do not feel that treatment of the condition is warranted others are embarrassed to speak with a health care provider about their condition. Pharmacological managements for stress urinary incontinence [3,4] are

many and varied; unfortunately to date, no medication is approved by the "food and drug administration" for curing SUI. Additionally, medications often used such as estrogen and alpha- adrenergic its effectiveness had not been proven yet. Pelvic Floor rehabilitation [7,8, 9] is generally the first-line treatment for female patients with SUI. The use of pelvic floor muscle exercises in the treatment of stress urinary incontinence is based on two functions of the pelvic floor muscles: support of the pelvic organ, and a contribution to the sphincter closure mechanism of the urethra. PFM program may be prescribed to increase strength, endurance, and coordination of muscle activity. Strengthen training decreases the frequency of SUI with time and skill training immediately reduces the amount of leakage. Studies have shown up to 70% improvement in symptoms of stress urinary incontinence following appropriately performed PFM strengthening training.

1.1 AIM OF THE STUDY

This study aims to reduce the effect of stress urinary incontinence in diabetic women by strengthening their pelvic floor muscles

1.2 OBJECTIVE OF THE STUDY

The pelvic floor muscles will be strengthened by performing exercises in various positions to reduce the effect of stress urinary incontinence in diabetic women.

1.3 MATERIALS AND METHODOLOGY

MATERIALS

Treatment couch
Pillow
Assessment chart
Bladder diary
Exercise chart

METHODOLOGY

Study design: This study is an experimental design with pre and posttest evaluation.

Sample collection: Threewomen with stress urinary incontinence based on the history were selected by convenient sample.

1.4 Inclusion Criteria

- Women aged between 45-60
- Women who had vaginal (or) caesarean delivery
- Women who were suffering from stress urinary incontinence with diabetes
- Women who have diabetes induced obesity
- Women who take diuretics

1.5 Exclusion Criteria

- All men
- Women aged below 45 years
- Women with Stress Urinary Incontinence, but non – diabetics
- Women with psychiatric and neurological disorders
- Women who had surgery for urogenital prolapse
- Women with chronic degenerative diseases that affects muscles and nerves.
- Women who have UUI
- Women who have MUI
- Women with uterine prolapse
- Women with collagen disorder
- Women with cardiac problems

1.6 Study period

- Three subjects fulfilling the inclusive criteria are included in the study for three months.

Study setting

- The study was conducted in Shri Indra Ganesan Institute Of Medical Science, College Of Physiotherapy Outpatient Department and

Ramakrishna Medical center Trichy.

Study method

Three patients who are satisfying the inclusive criteria are treated with pelvic floor muscles strengthening exercises in various positions

1.7 OUTCOME MEASURES

With the help of the measurement tools like assessment, Incontinence impact questionnaire

1.8 STATISTICAL ANALYSIS

The collected data will be tabulated and analyzed using descriptive & inferential statistics. To all the parameters mean and standard deviation (SD) will be used. Paired t-test will be used to analyze significant changes between pre-test & post-test measurements.

1.9 HYPOTHESIS OF THE STUDY

NULL HYPOTHESIS: The null hypothesis states that there is a no significant improvement on strengthening the pelvic floor muscles of diabetic women with stress urinary incontinence.

ALTERNATE HYPOTHESIS: The alternative hypothesis states that there is a significant improvement on strengthening the pelvic floor muscles of diabetic women with stress urinary incontinence.

2. PROCEDURE

The subject referred to Shri Indra Ganesan Institute Of Medical Science College Of Physiotherapy, outpatient department were considered for study informed consent was taken from the participants and they were arranged A total number of three subjects who are diagnosed as “stress urinary incontinence” with suitable inclusive criteria were selected for this study. Prior to the treatment pretest was conducted with incontinence impact questionnaire and the results were recorded. After a brief demonstration about the pelvic floor muscle strengthening training for a period of 12 weeks. The post test was conducted, and the results were recorded and analyzed to compare the pretest and posttest results. The results were recorded. The results of post test of the same parameter was recorded and compared.

2.1 PARAMETERS:

Assessment, Incontinence impact questionnaire

Incontinence Impact Questionnaire (IIQ-7)

Incontinence Impact Questionnaire (IIQ-7) is designed to evaluate distinctive domains of quality-of-life impairment. It is composed of 7 items:

1. Household chores
2. Physical recreation
3. Entertainment activity
4. Travel > 30 minutes away from home
5. Social activities
6. Emotional health (nervousness, depression, etc...)
7. Feeling frustration

Which is further subdivided into four domains.

1. PA – Physical Activity (items 1 & 2)
2. TR – Travel (items 3 & 4)
3. SA – Social Activities (item 5)
4. EH – Emotional Health (item 6 & 7)

Total score ranges from 0 to 100

Each item of these questionnaires consists of a Likert scale that rages form slight to moderate and from moderate to great. A higher score is the indication of reduced quality of life and severity of symptoms.

OREGON HEALTH & SCIENCE UNIVERSITY OHSU Urology	Patient Name: _____ Date of Birth: _____ MRN: _____ Date of Service: _____ Physician: _____

Incontinence Impact Questionnaire, Short Form (IIQ-7)

Some people find that accidental urine loss may affect their activities, relationships, and feelings. For each question, circle the response that best describes how much your activities, relationships, and feelings are being affected by urine leakage over the past month.

Has urine leakage (incontinence) affected your:

	Not at All	Slightly	Moderately	Greatly
Ability to do household chores (cooking, housecleaning, laundry)?	**0**	**1**	**2**	**3**
Physical recreation such as walking, swimming, or other exercise?	**0**	**1**	**2**	**3**
Entertaining activities (movies, concerts, etc.)?	**0**	**1**	**2**	**3**
Ability to travel by car or bus more than 30 minutes from home?	**0**	**1**	**2**	**3**
Participation in social activities outside your home?	**0**	**1**	**2**	**3**
Emotional health (nervousness, depression, etc.)?	**0**	**1**	**2**	**3**
Feeling frustrated?	**0**	**1**	**2**	**3**

Figure: 1

2.2 TECHNIQUES USED

KEGEL'S EXERCISES (PELVIC FLOOR EXERCISE)

Each woman in the study group was interviewed and face to face education was given about the anatomy and function of pelvic floor muscles, definition of stress urinary incontinence, factors improve muscle strength, definition, and benefits of these exercises. Lie on your back with legs out straight. Keep your stomach, buttocks and thigh muscles relaxed during the entire exercise. Breatheslowly. Notice your stomach rises when you exhale (or)breath out. Squeeze the pelvic muscles tight and hold the contraction for 5 seconds. Then relax for 10 seconds before starting the next contraction. Repeat this sequence of squeeze for 2 to 5 seconds and resting for 10 seconds for 10 repetitions.

Progression of pelvic floor exercises:

10 repetitions of 5 seconds contraction with 5 seconds relaxation time.

20 repetitions of 2 seconds contraction with 2 seconds relaxation time.

20 repetitions of 1 second contraction with 1 second relaxation time.

5 repetitions of 10 seconds contraction with 10 seconds relaxation time followed by 5 repetitions of strong contraction and stimulated cough with 1 minute interval. The recommended posture to be adopted during the prescribed exercise regimen also varies and includes sitting, kneeling, standing, and standing with legs astride. The recommended duration of the prescribed regimen varies widely from 10 minutes to 20 minutes.

PELVIC FLOOR BRIDGING EXERCISE

Find an open space on the floor and lie on your back, using a mat if you have one. Rest your knees, and place your feet flat on the floor, beneath your knees.Tighten your abdominal and buttock muscles by pushing your low back into the ground. Raise your hips to create a straight line from your knees to your shoulders. Squeeze your core and pull your belly button back towards your spine. Hold for 20 to 30 seconds. Lower the hips to return to the starting position.

BRIDGING WITH ADDUCTION EXERCISE

Bridge with adduction exercise will develop the muscle of our hip, improving the power of pelvic floor muscles. Start by lying face up on the ground with your arms at your sides and your knees bent. Place your feet flat on the floor, hip width apart with your toes facing away from you. Squeeze a ball(or)towel roll between your knees. Gently contract your abdominal muscles to flatten your lower back into the floor, lift your hip up off the floor keeping your abdominal muscles engaged, until your knees, hip and shoulders form a straight line. Hold for 20 to 30 sec. Lower the hip to return to the staring position.

SIDE LYING HIP ABDUCTION

It can strengthen the buttocks and outer thighs. Lie down on your side with legs extended and hips stacked one on top of the other. Bend your bottom elbow and place your lower arm underneath your head, allowing the full weight of your head to rest on your forearm. So,it's in line with your vertebrae. Raising your upper leg to just above your hip joint. Hold it for 20 to 30 seconds. Slowly lower your leg to its staring position. flip over to your opposite side and repeat the process with your other leg.

TABLE 1

Table 1 represent the mean values, mean difference, standard deviation, t value between the pre test and post test of incontinence impact questionnaire'

S. No	IIQ- 7	Mean	Mean Difference	Standard Deviation	T value
1	**Pre test**	25.14	15.18	4	6.57
2	**Post test**	39.95			

It explains the paired 't' test value of pretest Vs post test was 15.18 at 0.05 level of significance which was greater than tabulated 't' value of 6.57. This showed that there was a significant difference between pretest Vs post test results. The pretest mean was 25.14, posttest mean was 9.95 which shows the recovery of selected sample in response to intervention.

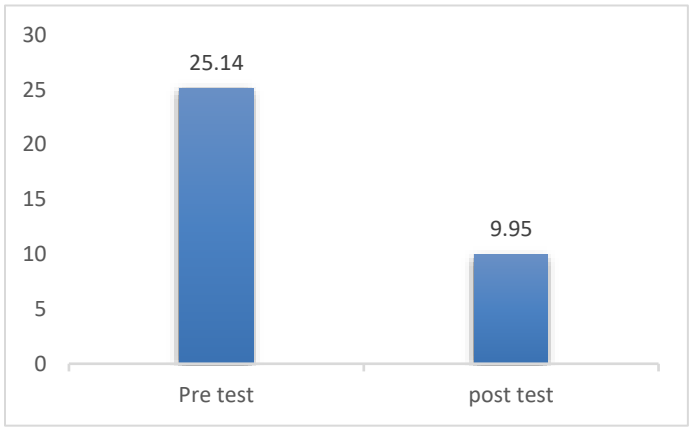

Figure: 2

Figure: 2 Graphical representation of pre-test and post test values of incontinence impact questionnaire

2.3 DISCUSSION

Stress urinary incontinence is a problem tackled by majority of females and is found to be related with diabetes mellitus. The aim of study was to find the effect of pelvic floor muscle strengthening training is improving the patient with stress urinary incontinence. A total no of three patients who had stress urinary incontinence were treated with pelvic floor muscles strengthening exercises. After 12 weeks a post test was conducted by incontinence impact questionnaire and result was recorded and further statistical analysis.

2.4 LIMITATIONS

This study duration was short only 12 weeks and the result apply to commonly and short term only, which might differ in longer run. Sample sizes take for the study is small and bigger example might have lead to some difference in the results. Limited parameter of outcome measures was used which might bias the result. There are some limitations with respect to data source and availability, which should be taken into consideration when interpreting the results.

2.5 RECOMMENDATIONS

A similar study can be conducted with pelvic floor muscle strengthening and bladder neck mobility. A similar study can be done with increased repetition of exercise of pelvic floor muscle. A similar study can be conducted with electrical stimulation on pelvic floor muscles to improve the patient with stress urinary incontinence. A similar study can be conducted with biofeedback method to stress urinary incontinence patient.

2.6 CONCLUSION

In the light of the present study result, it can be concluded that Kegel's exercise for duration not less than 6 weeks is an effective practice for stress urinary incontinence in women. As Kegel has a great advantage of being easy and can be done at any time without being noticed by others. It also has significant positive effect on strengthen pelvic floor muscles, reducing stress urinary incontinent symptom and significantly improve the quality of life of women with stress urinary incontinence, which is a vital indicator of their psychosomatic, emotional, and social functions. In due course it has been concluded that the diabetic urinary incontinence can get benefit from Kegel's exercise and other pelvic floor muscle strengthening exercise (bridging exercise) commonly known as pelvic floor muscle training.

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